SECTION 22 1343.16

FACILITY WET-WELL PACKAGED SEWAGE PUMPING STATIONS (INTERIOR)

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LANL MASTER SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the Engineering Standards Mechanical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within “stars“during editing.

This specification intended for single GGP-type buildings where gravity flow is not achievable. For centralized multi-building station refer to LANL Specification 33 3200, Wastewater Utility Pumping Stations.

Specification developed for ML-3 / ML-4 projects. For ML-1/ML-2, additional requirements and QA reviews are required.

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submersible pumps, basin, and equipment for sanitary sewer lift station.

1.2 LANL PERFORMED WORK

A. LANL’s Support Services Subcontractor will perform acceptance inspection, testing, adjusting and tie-in of lift station. See PART 3.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 3300, Submittal Procedures:

1. Catalog data.

2. Pump curves.

3. Operation and maintenance data.

a. Theory of operation.

b. Test procedure.

c. Operating procedures

d. Maintenance requirements

4. Warranties.

1.4 WARRANTY

A. Manufacturer's printed warranties shall apply to pumps.

B. Provide two year warranty after installation, including parts and labor.

C. Provide for repairs to be performed at the manufacturer's authorized warranty repair station located within a 200 mile radius of this Project.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Alternate products may be accepted; follow Section 01 2500, Substitution Procedures.

2.2 ACCEPTABLE MANUFACTURER

A. ABS (Piranha “S” Series), Homa, Sta-Rite, Hydromatic; provide grinder pump series.

B. Pumps shall be readily removable and replaceable without de-watering wet well or disconnecting any piping in wet well.

2.3 PERFORMANCE AND DESIGN REQUIREMENTS

A. See Schedule in PART 3.

2.4 PUMP MATERIALS

A. Motor housing, casing, discharge elbow, and other components: Gray cast iron, ASTM A48, ANSI Class 30.

B. Impeller: ASTM A48 cast iron or 440C stainless steel, hardened. Replaceable impeller wear ring.

C. Cutters: 440C stainless steel, hardened.

D. Shaft: Stainless steel.

E. Motor:

1. Rotor bars and short circuit rings: Aluminum.

2. Windings: Copper.

3. Stator winding and lead insulation: NEMA Class F.

F. Mechanical Seals:

1. Lower: Tungsten carbide/tungsten carbide.

2. Upper: Tungsten carbide/carbon.

G. Case Wear Ring: Steel with molded nitrile rubber.

H. Exposed Nuts and Bolts, Hardware: ANSI 304 stainless steel.

2.5 PUMP CONSTRUCTION

A. Water tight sealing rings against machined surfaces.

B. Cable Entry Design:

1. Seal: Torque-free mechanical compression type with strain relief. Submersible cable entry shall be field replaceable without replacing cable.

2. Seal junction chamber from motor area.

C. Pump Motor:

1. Dip and bake stator three times in NEMA Class F varnish and heat shrink fit into the stator housing. Do not use designs requiring penetration of stator housing.

D. Pump Shaft Bearings:

1. Permanently lubricated heavy duty, single row ball bearings.

E. Minimum B10 Bearing Life: 20,000 hours at any point on head-capacity curve.

F. Mechanical Seals: Tandem independent and run in a standard motor oil reservoir.

G. Impeller: Dynamically balanced, double shrouded, non-clog, with vane capable of handling solids, unless otherwise scheduled.

H. Provide sliding guide bar bracket unit to guide on at least two rails which is an integral part of pump unit. Do not permit any portion of the pump or guidance system to bear on sump floor. Do not use guide cables.

I. Provide metal-to-metal discharge pump/elbow connection seal. Do not use diaphragm or O-ring type seals.

2.6 PERFORMANCE

A. Pump motor:

1. Enclosed submersible type.

2. 3 phase motor.

3. Non-overloading throughout pump curve.

4. Capable of running dry indefinitely without damage.

5. Motor shall be rated for the site elevation.

2.7 PROTECTIVE COATING

A. Pump Exterior: Enamel or epoxy coating finish.

2.8 ACCESSORIES

A. Pump accessories supplied by pump manufacturer.

B. Provide pump accessories required for proper installation and/or as recommended by manufacturer, including the following.

1. Upper and intermediate guide bar brackets with stainless steel nuts and bolts.

2. Stainless steel guide rails and brackets with stainless steel nuts and bolts.

3. Stainless steel lift chain.

4. Safety chain hook.

5. Cable holder for pump cable and float cable.

6. Cable support grip.

7. Anchorage.

8. Cable rack for level control floats.

9. Self-weighted float switches.

10. Check valve, resilient seated, low resistance ball operation.

11. Plug valve, eccentric, flanged ends, line size, BUNA packing, neoprene plug facings, lever handle, DeZurik series 100, Fig. No. 118.

12. Standard discharge connection.

C. Controls:

1. RACO Verbatim – including the following.

a. Enclosure – NEMA 4X.

b. Environmental – Heater.

c. Local alarm relay output.

2. Milltronics Hydro-Ranger 200, Part No. 7ML1034 - 1AA1 with Echomax XPS-10 transducer, Part No. 7ML1115 - 0CA31.

3. NEMA 4X enclosure box for mounting of RACO Verbatim outside of, but attached to, motor control center. Provide connections in motor control center for RACO Verbatim unit.

4. Telephone line grounding/terminator box, Hoffman No. A-1086CHQRFG, with 1/2 inch plywood backing plate mounted inside. Mount box beside and connect to the RACO Verbatim box with 3/4 inch conduit nipple.

5. RACO Verbatim enclosure and backplate, Hoffman No. A-201608LP and No. A-20P16.

2.9 MOTOR CONTROL CENTER

A. Duplex pump control panel supplied by pump supplier.

1. Manufacturer: E.G. Pumps Controls, Hydromatic Q-panel.

B. Provide duplex pump controls required for proper installation and/or as recommended by manufacturer and mounted inside equipment room, including the following:

1. If MCC is required provide it with separate cubicle to accommodate Milltronics unit with glass view port on door.

2. Two pump Circuit Breakers: UL interrupting rating not less than 14,000 amperes RMS symmetrical at 480 volts or 22,000 amperes RMS symmetrical at 240 volts.

3. Two NEMA rated, full voltage non-reversing motor starters.

4. Duplex Logic Chassis (an anodized aluminum sub-assembly) with Logic Panel Including:

a. Two Hand-Off-Auto selector switches.

b. Two run pilot lights (red).

c. Two off pilot lights (green).

d. Level alarm pilot light.

e. Alarm silence pushbutton.

f. Motor over temperature sensor – shut pump down.

g. LED status indication pilot lights for each relay function.

5. Ground lugs for pump and service connections.

6. Enclosure NEMA 3R.

7. Additional control breaker - 15 amp, 1 pole.

8. Control power transformer - 2 KVA, 16.7 amps.

9. Phase Monitor Relay, 200-240 volt or 440-480 volt, 3 phase as required; capable of detecting loss of a single phase, under-voltage, over voltage, and voltage unbalance. Alarm will be sent to the RACO Verbatim unit.

10. Lightning surge arrestor.

11. Elapsed time meter for each pump.

12. Lag pump time delay relay.

13. Seal failure relay with pilot light.

14. Audible Alarm horn, 93 dB at 20 feet.

15. Alarm beacon with flasher.

16. Alarm memory circuit to maintain alarm beacon until manually reset.

17. Alarm and control enclosure.

18. Additional isolated dry contacts.

    a. Motor over-temperature (2) - contact type form "C".

    b. Motor overload trip (2) - contact type normally open.

    c. Seal failure (2) - contact type form "C".

    d. Power failure - contact type form "C".

19. High level float status light.

20. High level float test switch.

21. Local control panel disconnect. Mount beside, but exterior to, the control panel.

22. Main breaker.

23. Operating voltage sign and station name.

24. pH enclosure, Hoffman No. U-U504030.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install pumps, basin, and equipment in accordance with manufacturer's instructions and Contract Drawings.

B. Install pumps level, plumb, accurately aligned, with leak-proof pump connection, and easily removed without entering wet well.

C. Make no splices in cable.

D. Furnish and install all power connections to and from the motor control center, control panel, and monitors in accordance with provisions of Division 16 and the manufacturer’s instructions.

E. Provide communications link between the lift station monitoring/controls panel and the building automation system PC. Links, monitors, and controls shall be compatible with the building automation system. System shall be installed and available for testing during the Acceptance Inspection.

3.2 HIGH LEVEL FLOAT

A. Suspend on bracket per manufacturers instructions and as shown on Drawings.

B. Make no splices in cable.

C. Adjust float level per manufacturer’s instructions.

3.3 MANUFACTURER'S ON-SITE SERVICE

A. Arrange for a factory trained service engineer to be present to check installation and operation.

B. Arrange for a factory trained service engineer to provide a minimum of 4 hours per pump station of training to operating personnel on operation and maintenance of pumping equipment.

C. Provide a report by the service engineer certifying that equipment has been installed and is operating correctly.

3.4 LANL ACCEPTANCE INSPECTION, TESTING, ADJUSTING, AND TIE-IN

A. LANL Construction Inspector will contact LANL’s Facilities Management Representative at least 10 working days in advance to witness and accept the following:

1. Inspection, testing, and adjusting of alarms and controls on lift station.

2. Inspection of lift station for compliance with drawings and specifications.

B. LANL Construction Inspector to ensure all drains or buildings connected to the lift station has an approved WPF (Waste Profile Form) for discharge to the sanitary sewer for all anticipated wastewaters.

3.5 EQUIPMENT SCHEDULE

A. Pump Model [ ] with Impeller Model [ ].

1. GPM/TDH (feet): [ ]

2. HP: [ ]

3. Discharge Pipe (inches): [ ]

4. RPM: [ ]

5. Volts/Phase: [ ]

6. Max motor Input at design point (KW):[ ]

B. Site elevation: 7500 feet.

END OF SECTION

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Do not delete the following reference information:
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FOR LANL USE ONLY

This project specification is based on LANL Master Specification 22 1343.16 Rev. 0, dated March 24, 2006.